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NPIC/D-07-65

APR 1965

MEMORANDUM FOR: Deputy Director of Central Intelligence

THROUGH : Assistant Deputy Director (Intelligence)

SUBJECT : Research and Development Project Approval Request for a Study of Techniques for Improving Image Perceptibility

REFERENCE : DDCI Memorandum ER 63-88121, dated 23 December 1963, Approval of Research and Development Activities

In compliance with paragraph 4.b. of the reference, it is requested that the study on techniques for improving image perceptibility as outlined in the attachment be approved. The cost of this project is estimated at [redacted]

25X1

[redacted]

25X1

ARTHUR C. LUNDAHL
Director
National Photographic Interpretation Center

25X1

CONCUR: [redacted]

PAUL A. BOREL
Assistant Deputy Director (Intelligence)

3 MAY 19[illegible]
Date

APPROVED: (signed) Lyman B. Kirkpatrick

RICHARD HELMS
Deputy Director of Central Intelligence

17 MAY 1965
Date

Attachment: R&D Catalog

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SUBJECT: Research and Development Project Approval Request for a Study of Techniques for Improving Image Perceptibility

Distribution:
Orig & 2 - NPIC/SS/LB (1 withheld)
1 - A/DDI
1 - D/NPAM
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1 - DDCI
1 - D/NPIC(withheld)
1 - NPIC/P&S

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PROJECT CATALOG FORM

19 May 1965

1. PROJECT TITLE/CODE NAME
Study of Techniques for Improving Image Perceptibility

2. SHORT PROJECT DESCRIPTION This study will include: defining image perceptibility criteria, developing techniques for achieving maximum image perceptibility and breadboarding to establish feasibility.

3. CONTRACTOR NAME

25X1

4. LOCATION OF CONTRACTOR

25X1

5. CLASS OF CONTRACTOR
Manufacturer

6. TYPE OF C
NA

7. FUNDS

25X1

FY 1965 $

FY 1966 $

FY 19 67 $

8. REQUISITION NO.
NA

9. BUDGET PROJECT NO.
NP-ML-1 (Former NP-S-37)

10. EFFECTIVE CONTRACT DATE *(Begin - end)*
22 June 1965 - June 1966

11. SECURITY CLASS.
AA - Confidential
T - Unclassified
W - Unclassified

12. RESPONSIBLE DIRECTORATE/OFFICE/PROJECT OFFICER TELEPHONE EXTENSION

25X1

DDI/NPIC/P&DS

13. REQUIREMENT/AUTHORITY
The tone and shape dynamics of photographic images are often beyond the capability of visual perception. It may be possible to make images more perceptible without losing information. NPIC operations demand maximum perceptibility.

14. TYPE OF WORK TO BE DONE
Applied Research

15. CATEGORIES OF EFFORT

MAJOR CATEGORY	SUB-CATEGORIES
Modulated Light Imaging Systems	Images
	Visual Perception
	Electrophotographic Processes

16. END ITEM OR SERVICES FROM THIS CONTRACT/IMPROVEMENT OVER CURRENT SYSTEM, EQUIPMENT, ETC.
This study will result in intermediate reports which document findings of specific study projects and recommend techniques for utilizing this knowledge. In some instances there may be deliverable breadboards and proposals for development of prototype equipment.

17. SUPPORTING OR RELATED CONTRACTS *(Agency & Other)*/**COORDINATION** Considerable research directed toward understanding, forming, restoring and enhancing imagery has been and is being undertaken. However, no effort specifically duplicating this program has been discovered. Items NP-V-15, NP-V-17, NP-O-7, and NP-S-38 are related to this project. This research will yield knowledge of interest and possible direct impact to PSD, PAG, PID and TID.

18. DESCRIPTION OF INTELLIGENCE REQUIREMENT AND DETAILED TECHNICAL DESCRIPTION OF PROJECT *(Continue on additional page if required)*

See Continuation Sheet . . .

19. APPROVED BY AND DATE

OFFICE	DEPUTY DIRECTOR	DDCI

18. Aerial reconnaissance imagery often has characteristics which make the perception of certain image details difficult if not impossible. A specific field of technology has been developed in response to these characteristics -- that of automatic dodging. By automatic dodging, large areas which act as background to the fine detail in a photograph, can be selectively darkened or brightened without changing the contrast of the fine detail. In some types of photographic situations this dodging achieves dramatic improvement in the perceptibility of such imagery. Until recently automatic dodging was limited to the reproduction process. Under previous contract to NPIC/P&DS, [redacted] 25X1 proved that automatic dodging could be achieved with a scanning modulated light viewing system. In the course of the previous contract it was learned 25X1 that [redacted] had performed considerable research directed toward the development of new techniques for improving the perceptibility of imagery. The work [redacted] 25X1 had already accomplished, coupled with NPIC's absolute need for optimum image perceptibility formed the basis for establishing the study program which is outlined below:

I. Improving Image Perceptiblity

A. Defining the nature of images.

B. Defining optimum criteria for image perceptibility.

C. Developing photographic techniques for achieving optimum image perceptibility.

1. with good original images
2. with poor original images

D. Automation of these techniques in reproduction processes.

1. Contact printing
2. Projection printing
3. Development

E. Automation of these techniques in viewing processes

1. Direct optical viewers
2. Indirect optical viewers
3. Electronic viewers

In the course of this program it is anticipated that new knowledge will be evolved which will define previously unknown image properties which may be utilized to improve their perceptibility. In turn, this knowledge will be used to make carefully controlled reproductions of reconnaissance imagery which will display this improved perceptibility. After the desirability of such improvement has been established and verified by NPIC, techniques for automation in the reproduction processes will be investigated and evaluated and, once proven feasible, proposed for incorporation in the development of prototype equipment. The ultimate goal of this phase is the development of practical reproduction techniques and equipment which achieve improved modulation transfer functions over those available through conventional processes.

18. continued...

A coordinated directly analogous program is planned for viewing systems; however, it is anticipated that this will be more difficult since the implementation must be achieved on a real-time basis and at the same time satisfy all the other unique requirements of the human visual system.

None of the equipment development referred to above will be included under this program. Each time an equipment approach is proved feasible, a detailed development proposal will be prepared and, if accepted, contracted on a separate basis.

25X1 Appropriate security arrangements are already in existence at this [redacted] facility.

Next 6 Page(s) In Document Exempt

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TECHNICAL BACKGROUND PROCUREMENT INFORMATION

I. Contractor
A. Name and address: [redacted] 25X1

25X1 [redacted]

B. Evaluation of previous performance: Very good on Modulated-Light Direct Film Viewer Feasibility Study

II. Brief description of this procurement: This study will include: defining image perceptibility criteria, developing techniques for achieving maximum image perceptibility and breadboarding to establish feasibility. Estimated total amt. $[redacted] 25X1

A. Deliverable items: Intermediate and final reports with possible deliverable breadboards and proposals for development of prototype equipment.

B. Is this procurement for other than a standard, "off the shelf" or slightly modified commercial item? Yes If "yes", is it anticipated that any more of this unit will be procured? N/A If so, a complete set of directly reproducible manufacturing drawings and specifications would normally be included in this procurement. Comments: This is a study and no hardware will be produced under this contract. A considerable amount of new equipment will be purchased [redacted] this will be government property. 25X1

C. Will contract cover a period of more than 90 days? Yes
If "yes", are progress reports desired? Yes If so, indicate frequency, content and number of copies desired: Monthly reports are desired explaining what phases of the study were completed or worked on, what results were found, how these results were arrived at, and in which direction the work would continue.

D. Is any Government-owned property to be provided to the contractor?
Yes If so, list and indicate its availability (where, when, etc.) Aerial photography of an unclassified nature will be supplied by the monitor

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for experimentation and study. The film will be returned to the monitor upon completion of the tests.

E. Is any special tooling involved? Yes

F. Security:

1. Association with the Sponsor is Confidential
2. The specifications and/or drawings are Unclassified
3. The item is Unclassified
4. Contractor personnel known to be aware of this proposed procurement:

[redacted] 25X1

5. Other security information Cleared channels exist.

III. Reasons for selection of this source. If other sources were considered, indicate results. If no other sources were considered, list the reasons why this firm is considered to be uniquely qualified to perform this work.

25X1 [redacted] has already done much basic research in this area under previous contracts. Their proposal brings forth many new and imaginative ideas which are of a proprietary nature. It is our opinion that [redacted] is the best qualified source we can turn to for this study. 25X1

IV. If contract will cover deliverable item(s) state room location where equipment will be installed N/A. (It is extremely important that the Engineering Data Sheet including room location and any other pertinent facts be submitted to NPIC Engineering Section as far as possible in advance of delivery.)

25X1

V. Technical contact [redacted] (Name) 5 May 1965 (Date) [redacted] (Telephone) 25X1

In the event additional space is required, use the reverse side(s) of this form, with a reference to the item number to which the comment applies.

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